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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,665	10/01/2003	David E. Lowell	200208636-1	8983
22879 7590 11/16/2007 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER ZHE, MENG YAO	
			ART UNIT 2195	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/676,665

Applicant(s)

LOWELL ET AL.

Examiner

MengYao Zhe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-43 are presented for examination.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. The following claim languages are unclear and indefinite:

- i) Claim 1, it is uncertain what the relationship is between "configuring hardware to trap instructions...simulating trapped instructions with the virtual machine monitor" found in lines 5-7 and the rest of the claim <i.e. what does simulating an instruction has to do with performing maintenance? If, for example, it is the second instance that needs to be maintained while using the first instance, why would there be a need to trap instructions executed by the first instructions and simulating it on a VM monitor?>.
- ii) Claim 21, it is not clearly understood as to how "create an illusion that the first instance has control of the hardware" in line 9 is related to

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"the second instance being a substitute for the first instance" <i.e. if the second instance is running the first instance, why would the VM monitor be trapping and running instructions of the first instance?>.

Claim 33 has the same deficiencies as claim 21.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 10-23, 27-34, 38-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adamovits et al. (hereafter Adamovits), in view of Kaneda et al., Patent No. 4,347,565 (hereafter kaneda).

6. Adamovits was cited in the last office action.

7. As per claim 1, 21, 33, Adamovits substantially teaches a method of performing online computer maintenance on at least one node, the method comprising:

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running a virtual machine monitor; (*Column 1, lines 65-Column 2, line 5: the apparatus for migrating control corresponds to the monitor*)

running a first operating instance on the virtual machine monitor; (*Figure 2, Original software system 50*)

running a second operating system instance on the virtual machine monitor as a substitute for the first instance; and (*Figure 2, Replacement Software System 70*)

performing the maintenance with respect to one of the first and second operating system instances while using the other of the first and second operating system instances. (*Column 1, lines 11- 35: Background provides motivation for process migration, one of them is software upgrade, which corresponds to a type of maintenance.*)

Adamovits does not specifically teach configuring hardware to trap instructions executed by the first operating system instance; simulating trapped instructions with the virtual machine monitor.

However, Kaneda teaches using a virtual machine monitor, running on hardware, to trap instructions executed by the first operating system instance; simulating trapped instructions with the virtual machine monitor for the purpose of using the virtual machine monitor in controlling resources (*Column 2, lines 10-23; Column 4, lines 1-13*).

It would have been obvious for one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Adamovits with configuring hardware

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to trap instructions executed by the first operating system instance; simulating trapped instructions with the virtual machine monitor because it allows the virtual machine monitor to control resources.

8. As per claim 2, 22, Adamovits teaches wherein the second operating system instance is run as a substitute by migrating at least one application from the first operating system instance to the second operating system instance, and using the migrated applications on the second operating system instance (*Column 1 lines 65 to Column 2, lines 30*).

9. As per claim 3, 23, 34, Adamovits teaches shutting down the first operating system instance after the second operating system instance has been run as a substitute for the first operating system instance. (*Column 2 lines 24 to 45, Column 6, lines 55 to 60: shutting down the first instance corresponds to handing over complete control from the first software system to the replacement software system.*)

10. As per claim 10, 27, 38, Adamovits teaches wherein applications running on the first operating system instance are migrated to the second instance; and wherein software maintenance is performed. (*Column 1 lines 65 to Column 2, lines 55*)

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11. As per claim 11, Adamovits teaches shutting down one of the first and second operating system instances after the applications have been migrated. (*Column 6, lines 50 to 60*)

12. As per claim 12, Adamovits wherein the second operating system instance is an upgraded operating system; and wherein applications running on the first operating system instance are migrated to the second operating system instance. (*Column 1, lines 10 to 35, Column 1, line 65 to Column 2 line30*)

13. As per claim 13, 28, 39, Adamovits teaches wherein the maintenance includes modifying the second operating system instance; and wherein the method further includes migrating applications running on the first operating system instance to the second operating system instance. (*Column 13, lines 1 to 15: Mapping and storing corresponds to modifying.*)

14. As per claim 14, 29, 40, Adamovits teaches migrating applications from the first operating system instance to the second operating system instance before the maintenance is performed;

Adamovits, however, is silent to, the specifics of

migrating the applications from the second operating system instance back to the first operating system instance after the maintenance has been performed; and shutting down the second instance following the application migration to the first operating system instance.

There is nothing in the teaching of Adamovits to prevent reinitializing the first operating system instance should the second operating system instance wish to migrate its applications back to the first operating system instance. Moreover, since it is taught to migrate to an upgraded second operating system instance while shutting down the first operating system instance, it would be obvious to one having ordinary skill in the art of process migration on virtual machines to move back to the first instance should the first instance get upgraded as well.

15. As per claim 15, Adamovits teaches wherein a first application instance is running on the first operating system instance before the maintenance is performed; and wherein the maintenance includes running a second application instance on the second operating system instance, modifying the second application instance, and cutting over from the first application instance to the modified second application instance. (*Column 13, lines 1 to 15: Mapping and storing corresponds to modifying. Column 6, lines 55 to 60 reads on cutting over.*)

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16. As per claim 16, 30, 41, Adamovits teaches wherein the virtual machine monitor allows at least one of the first and second operating system instances to have direct control over at least one of a processing unit, memory and I/O of the at least one node.

(Column 1, line 65 to Column 2 Line 39 and Column 6, lines 55 to 60)

17. As per claim 17, 31, 42, Adamovits teaches wherein the first operating system instance is booted prior to running the virtual machine monitor; and wherein the virtual machine monitor is interposed beneath the first operating system instance when maintenance is to be performed. *(Column 5, lines 45 to 65; Figure 2 shoes that the original system is already up and running before migration.)*

18. As per claim 18, 32, 43, Adamovits teaches wherein at least one of a processing unit, memory and I/O is devirtualized after the maintenance has been performed.

(Figure 12, the original is disabled.)

19. As per claim 19, Adamovits teaches wherein a single processor is used to run the virtual machine monitor and the first and second operating system instances.

(Figure 1, Processor 12, it is the one and only processor in the system as disclose.)

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20. As per claim 20, Adamovits teaches wherein a single node is used to run the virtual machine monitor and the first and second operating system instances. (*Column 6, lines 20 to 65, Figure 1 and Figure 2.*)

21. Claims 4-9, 24-26, 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adamovits et al. (Adamovits), Patent No. 6,698,017 in view of Kaneda et al, Patent No. 4,347,565 (hereafter Kaneda) further in view of Tremain, Pub No. US 2002/0069369.

22. Tremain was cited in the last office action.

23. As per claim 4, Adamovits in view of Kaneda does not teach wherein the maintenance includes hardware servicing; and wherein the second operating system instance is run without a dependency on the hardware to be serviced.

However, Tremain teaches wherein the maintenance includes hardware servicing; and wherein the second operating system instance is run without a dependency on the hardware to be serviced for the purpose of configuration while running servers. (*Paragraphs 43, 44, 212*)

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to have modified the invention of Adamovits with wherein the maintenance includes hardware servicing; and wherein the second operating system

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instance is run without a dependency on the hardware to be serviced, as taught by Tremain, because it allows for configuration while running servers.

24. As per claim 5, Tremain teaches wherein the servicing includes removing the hardware from the at least one node. (*Paragraphs 43, 44, 212*)

25. As per claims 6, 24, 35, Adamovits teaches wherein the virtual machine monitor is used to hide the hardware to be serviced from the second operating system instance during bootup of the second operating system instance. (*Column 5, lines 30-45, Column 6, lines 20-25*).

26. As per claim 7, Adamovits teaches wherein the virtual machine monitor releases its own dependencies on hardware prior to removal. (*Column 13, lines 1-10*)

27. As per claim 8, 25, 36, Tremain teaches wherein the maintenance includes adding the hardware; wherein the virtual machine monitor discovers the hardware; and wherein the virtual machine monitor shields the first operating system instance from the hardware as the hardware is being added. (*Paragraphs 43, 44, 212*)

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28. As per claim 9, 26, 37, Tremain teaches wherein the hardware is added before the second operating system instance is booted; and wherein the second instance is allowed during bootup to see the hardware. (*Paragraphs 43, 44, 212*)

Response to Arguments

29. Applicant's argument filed on 9/4/2007 regarding to claims 1-43 has been fully considered, but they are moot in view of the new ground of rejection.

Conclusion

30. Applicants' amendments necessitated the new grounds of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to MengYao Zhe whose telephone number is 571-272-6946. The examiner can normally be reached on Monday Through Friday, 10:00 - 8:00 EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached at 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


MENG-AI AN
SUPERVISORY PATENT EXAMINER
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